

What is claimed is:

1. A composition having an acidic pH, the composition being prepared by mixing ingredients comprising:

a salt of phosphoric acid; and

5 a preformed, or in-situ generated, solution or suspension of an acidic sparingly-soluble Group IIA complex ("AGIIS"), wherein the solution or suspension of AGIIS is in an amount sufficient to render the acidic pH of the composition to be less than about 2.

10 2. The composition of claim 1, wherein the solution or suspension of the AGIIS is isolated from a mixture comprising a mineral acid and a Group IIA hydroxide, or a Group IIA salt of a dibasic acid, or a mixture of the two.

3. The composition of claim 2, wherein the Group IIA hydroxide comprises calcium hydroxide, the mineral acid comprises sulfuric acid and the Group IIA salt of a dibasic acid comprises calcium sulfate.

15 4. The composition of claim 1, wherein the solution or suspension of AGIIS having a certain acid normality is less effective in charring sucrose and less corrosive to an animal skin than a saturated solution of calcium sulfate in sulfuric acid having the same acid normality, and wherein the solution or suspension of an AGIIS is of low volatility at room temperature and pressure.

20 5. The composition of claim 1, wherein the salt of phosphoric acid comprises a divalent metal salt of phosphoric acid.

6. The composition of claim 5, wherein the divalent metal comprises an alkali earth metal or a metal of first transition series.

25 7. The composition of claim 1, wherein the salt of phosphoric acid comprises a mono-valent metal salt of phosphoric acid.

8. The composition of claim 7, wherein the mono-valent metal comprises an alkali metal.

9. The composition of claim 1, further comprising an additive.

5 10. The composition of claim 9, wherein the additive comprises an alcohol.

11. The composition of claim 10, wherein the alcohol comprises a lower aliphatic alcohol having six or less carbon atoms.

12. The composition of claim 9, wherein the additive comprises an organic acid.

10 13. The composition of claim 12, wherein the organic acid comprises lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

15 14. The composition of claim 9, wherein the additive comprises a surface active agent.

15. The composition of claim 14, wherein the surface active agent comprises a cationic surface active agent, an anionic surface agent, a non-ionic surface active agent, or a mixture thereof.

20 16. The composition of claim 9, wherein the additive comprises a periodic acid.

17. The composition of claim 9, wherein, based on the final weight of the composition, the amount of the additive ranges from about 0.01% to about 99%.

18. The composition of claim 1, wherein the solution or suspension of AGIIS is present in an amount in excess of the amount required to completely convert the salt of phosphoric acid to phosphoric acid.

19. A composition having an acidic pH, the composition being prepared by mixing ingredients comprising:

a salt of phosphoric acid; and

a preformed, or in-situ generated, solution or suspension of an acidic sparingly-soluble Group IIA complex ("AGIIS"), wherein the solution or suspension of AGIIS is in an amount sufficient to render the acidic pH of the composition to be less than about 2;

wherein the solution or suspension of the AGIIS is isolated from a mixture formed by mixing ingredients comprising a mineral acid and a Group IIA hydroxide, or a Group IIA salt of a dibasic acid, or a mixture of the two, and wherein the solution or suspension of AGIIS having a certain acid normality is less effective in charring sucrose and less corrosive to an animal skin than a saturated solution of calcium sulfate in sulfuric acid having the same acid normality, and wherein the solution or suspension of an AGIIS is of low volatility at room temperature and pressure; and

wherein the salt of phosphoric acid comprises a divalent metal salt of phosphoric acid or a mono-valent metal salt of phosphoric acid.

20. The composition of claim 19, further comprising an additive.

21. The composition of claim 20, wherein the additive comprises lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

22. The composition of claim 19, wherein the solution or suspension of AGIIS is in an amount in excess of the amount required to completely convert the salt of phosphoric acid to phosphoric acid.

23. A composition having an acidic pH, the composition being prepared by mixing ingredients comprising:

a salt of phosphoric acid;

a preformed, or in-situ generated, solution or suspension of an acidic sparingly-soluble Group IIA complex ("AGIIS"), wherein the solution or suspension of AGIIS is in an amount sufficient to render the acidic pH of the composition to be less than about 2; and

an organic acid comprising lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

wherein the solution or suspension of the AGIIS is isolated from a mixture formed by mixing ingredients comprising a mineral acid and a Group IIA hydroxide, or a Group IIA salt of a dibasic acid, or a mixture of the two, and wherein the solution or suspension of AGIIS having a certain acid normality is less effective in charring sucrose and less corrosive to an animal skin than a saturated solution of calcium sulfate in sulfuric acid having the same acid normality, and wherein the solution or suspension of an AGIIS is of low volatility at room temperature and pressure; and

wherein the salt of phosphoric acid comprises a divalent metal salt of phosphoric acid or a mono-valent metal salt of phosphoric acid.

24. The composition of claim 23, wherein the solution or suspension of AGIIS is in an amount in excess of the amount required to completely convert the salt of phosphoric acid to phosphoric acid.

25. A prepared nutriment comprising:
a nutriment material; and
absorbed therein or adsorbed thereon being a solution or
suspension of a composition having an acidic pH, the composition being
prepared by mixing ingredients comprising:

5 a salt of phosphoric acid; and
preformed, or in-situ generated, solution or suspension of an
acidic sparingly-soluble Group IIA complex ("AGIIS"), wherein the
solution or suspension of AGIIS is in an amount sufficient to render the
10 acidic pH of the composition to be less than about 2.

26. The prepared nutriment of claim 25, wherein the solution or
suspension of the AGIIS is isolated from a mixture comprising a mineral acid
and a Group IIA hydroxide, or a Group IIA salt of a dibasic acid, or a mixture
of the two.

15 27. The prepared nutriment of claim 26, wherein the Group IIA
hydroxide comprises calcium hydroxide, the mineral acid comprises sulfuric
acid and the Group IIA salt of a dibasic acid comprises calcium sulfate.

28. The prepared nutriment of claim 25, wherein the solution or
suspension of AGIIS having a certain acid normality is less effective in charring
20 sucrose and less corrosive to an animal skin than a saturated solution of calcium
sulfate in sulfuric acid having the same acid normality, and wherein the solution
or suspension of an AGIIS is of low volatility at room temperature and pressure.

29. The prepared nutriment of claim 25, wherein the salt of
phosphoric acid comprises a divalent metal salt of phosphoric acid.

25 30. The prepared nutriment of claim 29, wherein the divalent metal
comprises an alkali earth metal or a metal of first transition series.

31. The prepared nutriment of claim 25, wherein the salt of phosphoric acid comprises a mono-valent metal salt of phosphoric acid.

32. The prepared nutriment of claim 31, wherein the mono-valent metal comprises an alkali metal.

5 33. The prepared nutriment of claim 25, further comprising an additive.

34. The prepared nutriment of claim 33, wherein the additive comprises an alcohol.

10 35. The prepared nutriment of claim 34, wherein the alcohol comprises a lower aliphatic alcohol having six or less carbon atoms.

36. The prepared nutriment of claim 33, wherein the additive comprises an organic acid.

15 37. The prepared nutriment of claim 36, wherein the organic acid comprises lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

38. The prepared nutriment of claim 33, wherein the additive comprises a cationic surface active agent, an anionic surface active agent, a non-ionic surface active agent, or a mixture thereof.

20 39. The prepared nutriment of claim 25, wherein the additive comprises periodic acid.

40. The prepared nutriment of claim 25, wherein the nutriment material comprises an animal product, a plant product, a beverage, or a mixture thereof.

41. The prepared nutriment of claim 25, wherein the solution or suspension of AGIIS is in an amount in excess of the amount required to completely convert the salt of phosphoric acid to phosphoric acid.

42. The prepared nutriment of claim 41 further comprising lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

43. A prepared nutriment comprising:
a nutriment material; and
absorbed therein or adsorbed thereon being a solution or suspension of a composition having an acidic pH, the composition being prepared by mixing ingredients comprising:
a divalent or mono-valent metal salt of phosphoric acid; and
preformed, or in-situ generated, solution or suspension of an acidic sparingly-soluble Group IIA complex ("AGIIS"), wherein the solution or suspension of the AGIIS is isolated from a mixture a mixture formed by mixing ingredients comprising comprising a mineral acid and a Group IIA hydroxide, or a Group IIA salt of a dibasic acid, or a mixture of the two, and wherein the solution or suspension of AGIIS is in an amount sufficient to render the acidic pH of the composition to be less than about 2; and
an additive comprising an alcohol, an organic acid, a periodic acid, a surface active agent, or a combination thereof.

44. The prepared nutriment of claim 43, wherein the Group IIA hydroxide comprises calcium hydroxide, the mineral acid comprises sulfuric acid, and the Group IIA salt of a dibasic acid comprises calcium sulfate.

5 45. The prepared nutriment of claim 43, wherein the solution or suspension of AGIIS having a certain acid normality is less effective in charring sucrose and less corrosive to an animal skin than a saturated solution of calcium sulfate in sulfuric acid having the same acid normality, and wherein the solution or suspension of an AGIIS is of low volatility at room temperature and pressure.

10 46. The prepared nutriment of claim 43, wherein the divalent metal comprises an alkali earth metal or a metal of first transition series.

47. The prepared nutriment of claim 43, wherein the mono-valent metal comprises an alkali metal.

15 48. The prepared nutriment of claim 43, wherein the additive comprises lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

49. The prepared nutriment of claim 43, wherein the additive comprises a cationic surface agent, an anionic surface active agent, a non-ionic surface active agent, or a mixture thereof.

20 50. The prepared nutriment of claim 43, wherein the nutriment material comprises an animal product, a plant product, a beverage, or a mixture thereof.

51. The prepared nutriment of claim 43, wherein the solution or suspension of AGIIS is in an amount in excess of the amount required to

completely convert the divalent or the mono-valent metal salt of phosphoric acid to phosphoric acid.

52. A prepared nutriment comprising:

a nutriment material; and

5 absorbed therein or adsorbed thereon being a solution or suspension of a composition having an acidic pH, the composition being prepared by mixing ingredients comprising:

a divalent or mono-valent metal salt of phosphoric acid;

10 a preformed, or in-situ generated, solution or suspension of an acidic sparingly-soluble Group IIA complex ("AGIIS"), wherein the solution or suspension of the AGIIS is isolated from a mixture formed by mixing ingredients comprising a mineral acid and a Group IIA hydroxide, or a Group IIA salt of a dibasic acid, or a mixture of the two, and wherein the solution or suspension of AGIIS is in an amount in
15 excess of the amount required to completely convert the salt of divalent or mono-valent metal salt of phosphoric acid to phosphoric acid; and

an additive comprising an alcohol, an organic acid, a periodic acid, a surface active agent, or a combination thereof.

53. The prepared nutriment of claim 52, wherein the Group IIA
20 hydroxide comprises calcium hydroxide, the mineral acid comprises sulfuric acid, and the Group IIA salt of a dibasic acid comprises calcium sulfate.

54. The prepared nutriment of claim 52, wherein the solution or
suspension of AGIIS having a certain acid normality is less effective in charring
sucrose and less corrosive to an animal skin than a saturated solution of calcium
25 sulfate in sulfuric acid having the same acid normality, and wherein the solution or suspension of an AGIIS is of low volatility at room temperature and pressure.

55. The prepared nutriment of claim 52, wherein the divalent metal comprises an alkali earth metal or a metal of first transition series.

56. The prepared nutriment of claim 52, wherein the mono-valent metal comprises an alkali metal.

5 57. The prepared nutriment of claim 52, wherein the additive comprises lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

10 58. The prepared nutriment of claim 52, wherein the additive comprises a cationic surface agent, an anionic surface active agent, a non-ionic surface active agent, or a mixture thereof.

59. The prepared nutriment of claim 52, wherein the nutriment material comprises an animal product, a plant product, a beverage, or a mixture thereof.

15 60. A prepared nutriment comprising:
a nutriment material; and
absorbed therein or adsorbed thereon being a solution or
suspension of a composition having an acidic pH, the composition being
prepared by mixing ingredients comprising a mineral acid and a salt of
20 phosphoric acid, wherein the amount of mineral acid is in an amount sufficient to render the acidic pH of the composition to be less than about 2.

61. The prepared nutriment of claim 60, wherein the mineral acid comprises sulfuric acid.

62. The prepared nutriment of claim 60, wherein the salt of phosphoric acid comprises bivalent or mono-valent metal salt of phosphoric acid.

63. The prepared nutriment of claim 60 further comprising lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

64. The prepared nutriment of claim 60, wherein the nutriment material comprises an animal product, a plant product, a beverage, or a mixture thereof.

65. A method for reducing biological contaminants in a nutriment material comprising:

contacting the nutriment material with a solution or suspension of a composition having an acidic pH, the composition being prepared by mixing ingredients comprising:

a salt of phosphoric acid; and

a preformed, or in-situ generated, solution or suspension of an acidic sparingly-soluble Group IIA complex ("AGIIS"), wherein the solution or suspension of AGIIS is in an amount sufficient to render the acidic pH of the composition to be less than about 2.

66. The method of claim 65, wherein the solution or suspension of the AGIIS is isolated from a mixture comprising a mineral acid and a Group IIA hydroxide, or a Group IIA salt of a dibasic acid, or a mixture of the two.

67. The method of claim 66, wherein the Group IIA hydroxide comprises calcium hydroxide, the mineral acid comprises sulfuric acid and the Group IIA salt of a dibasic acid comprises calcium sulfate.

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5 68. The method of claim 65, wherein the solution or suspension of AGIIS having a certain acid normality is less effective in charring sucrose and less corrosive to an animal skin than a saturated solution of calcium sulfate in sulfuric acid having the same acid normality, and wherein the solution or suspension of an AGIIS is of low volatility at room temperature and pressure.

69. The method of claim 65, wherein the salt of phosphoric acid comprises a divalent metal salt of phosphoric acid.

70. The method of claim 69, wherein the divalent metal comprises an alkali earth metal or a metal of first transition series.

10 71. The method of claim 65, wherein the salt of phosphoric acid comprises a mono-valent metal salt of phosphoric acid.

72. The method of claim 65, wherein the mono-valent metal comprises an alkali metal.

73. The method of claim 65, further comprising an additive.

15 74. The method of claim 73, wherein the additive comprises an alcohol.

75. The method of claim 74, wherein the alcohol comprises a lower aliphatic alcohol having six or less carbon atoms.

20 76. The method of claim 73, wherein the additive comprises an organic acid.

77. The method of claim 76, wherein the organic acid comprises lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid,

benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

78. The method of claim 73, wherein the additive comprises a surface active agent.

5 79. The method of claim 78, wherein the surface active agent comprises a cationic surface active agent, an anionic surface active agent, a non-ionic surface active agent, or a mixture thereof.

80. The method of claim 73, wherein the additive comprises periodic acid.

10 81. The method of claim 65, wherein the nutriment material comprises an animal product, a plant product, a beverage, or a mixture thereof.

82. The method of claim 65, wherein the solution of suspension of AGIIS is in an amount in excess of the amount required to completely convert the salt of phosphoric acid to phosphoric acid.

15 83. The method of claim 65, wherein the biological contaminants comprise microbes.

84. The method of claim 65, wherein the biological contaminants comprise mold.

20 85. A method for reducing biological contaminants in a nutriment material comprising:

 contacting the nutriment material with a solution or suspension of an composition having an acidic pH, the composition being prepared by mixing ingredients comprising:

 a divalent or mono-valent metal salt of phosphoric acid;

a preformed, or in-situ generated, solution or suspension of an acidic sparingly-soluble Group IIA complex ("AGIIS"), wherein the solution or suspension of the AGIIS is isolated from a mixture formed by mixing ingredients comprising comprising a mineral acid and a Group IIA hydroxide, or a Group IIA salt of a dibasic acid, or a mixture of the two; and wherein the solution or suspension of AGIIS is in an amount sufficient to render the acidic pH of the composition to be less than about 2; and

an additive comprising an alcohol, an organic acid, a periodic acid, a surface active agent, or a combination thereof.

86. The method of claim 85, wherein the Group IIA hydroxide comprises calcium hydroxide, the mineral acid comprises sulfuric acid, and the Group IIA salt of a dibasic acid comprises calcium sulfate.

87. The method of claim 85, wherein the solution or suspension of AGIIS having a certain acid normality is less effective in charring sucrose and less corrosive to an animal skin than a saturated solution of calcium sulfate in sulfuric acid having the same acid normality, and wherein the solution or suspension of an AGIIS is of low volatility at room temperature and pressure.

88. The method of claim 85, wherein the divalent metal comprises an alkali earth metal or a metal of first transition series.

89. The method of claim 85, wherein the mono-valent metal comprises an alkali metal.

90. The method of claim 85, wherein the additive comprises lactic acid, acetic acid, propionic acid, oxalic acid, peracetic acid, sorbic acid, benzoic acid, butyric acid, glycolic acid, formic acid, monoperphthalic acid, or a mixture thereof.

91. The method of claim 85, wherein the additive comprises a cationic surface active agent, an anionic surface active agent, a non-ionic surface active agent, or a mixture thereof.

5 92. The method of claim 85, wherein the additive comprises a lower aliphatic alcohol having six or less carbon atoms.

93. The method of claim 85, wherein the nutriment material comprises an animal product, a plant product, a beverage, or a mixture thereof.

10 94. The method of claim 85, wherein the solution or suspension of AGIIS is in an amount in excess of the amount required to completely convert the divalent or mono-valent metal salt of phosphoric acid to phosphoric acid.

95. The method of claim 85, wherein the biological contaminants comprise microbes.

96. The method of claim 85, wherein the biological contaminants comprise mold.